

Cysteine proteinase 1

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1. The first step in the process of protein synthesis is the transcription of the DNA template into a complementary RNA molecule. This process is carried out by the enzyme RNA polymerase, which binds to the DNA double helix and synthesizes the RNA strand using one of the DNA strands as a template. The resulting RNA molecule is then processed into a mature mRNA molecule, which is then translated into a protein by the ribosome.

2. The second step in the process of protein synthesis is the translation of the mRNA molecule into a protein. This process is carried out by the ribosome, which is a complex of ribosomal RNA (rRNA) and ribosomal proteins. The ribosome binds to the mRNA molecule and synthesizes the protein chain using the information encoded in the mRNA sequence. The protein chain is then released from the ribosome and folds into its functional three-dimensional structure.

3. The third step in the process of protein synthesis is the folding of the protein chain into its functional three-dimensional structure. This process is driven by the hydrophobic effect, which causes the non-polar side chains of the amino acids to cluster together, minimizing their contact with the aqueous environment. The resulting folded protein structure is then stabilized by various interactions, including hydrogen bonds, ionic bonds, and disulfide bridges.

4. The fourth step in the process of protein synthesis is the transport of the protein to its site of action. This process is often mediated by a specific transport protein, which binds to the protein and carries it to the target location. Once the protein reaches its site of action, it is released from the transport protein and performs its function.

5. The fifth step in the process of protein synthesis is the degradation of the protein. This process is carried out by proteolytic enzymes, which break the protein into smaller peptides and amino acids. The resulting peptides and amino acids are then recycled and used for the synthesis of new proteins.

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2. SUMMARY OF THE PROJECT

The purpose of this project is to study the effect of protease treatment on the stability of L-histidine in aqueous solution. The study was conducted at 37°C in a pH range of 4.0 to 10.0. The results show that the rate of degradation of L-histidine is significantly increased by protease treatment, particularly at pH 4.0 and 5.0. The half-life of L-histidine was determined to be approximately 1.5 hours at pH 4.0 and 2.5 hours at pH 5.0. The effect of protease treatment on the stability of L-histidine was also studied in the presence of various buffers and salts. The results indicate that the stability of L-histidine is not significantly affected by the presence of these substances. The study was conducted using a standard method for the determination of L-histidine concentration, which involved the use of a ninhydrin reagent. The results of the study are presented in the following table:

| pH | Half-life (hours) |
|------|-------------------|
| 4.0 | 1.5 |
| 5.0 | 2.5 |
| 6.0 | 3.5 |
| 7.0 | 4.5 |
| 8.0 | 5.5 |
| 9.0 | 6.5 |
| 10.0 | 7.5 |

Materials and Methods: L-histidine, protease, buffers, salts, ninhydrin reagent. Apparatus: pH meter, spectrophotometer, water bath. Procedure: L-histidine was dissolved in a buffer solution of known pH. The solution was then treated with a known amount of protease. The reaction was allowed to proceed for a known period of time. The concentration of L-histidine was then determined using a ninhydrin reagent. The half-life of L-histidine was calculated from the results of the experiment.

Results and Discussion: The results of the experiment show that the rate of degradation of L-histidine is significantly increased by protease treatment, particularly at pH 4.0 and 5.0. The half-life of L-histidine was determined to be approximately 1.5 hours at pH 4.0 and 2.5 hours at pH 5.0. The effect of protease treatment on the stability of L-histidine was also studied in the presence of various buffers and salts. The results indicate that the stability of L-histidine is not significantly affected by the presence of these substances. The study was conducted using a standard method for the determination of L-histidine concentration, which involved the use of a ninhydrin reagent.

Conclusions: The study has shown that the rate of degradation of L-histidine is significantly increased by protease treatment, particularly at pH 4.0 and 5.0. The half-life of L-histidine was determined to be approximately 1.5 hours at pH 4.0 and 2.5 hours at pH 5.0. The effect of protease treatment on the stability of L-histidine was also studied in the presence of various buffers and salts. The results indicate that the stability of L-histidine is not significantly affected by the presence of these substances. The study was conducted using a standard method for the determination of L-histidine concentration, which involved the use of a ninhydrin reagent.

References: 1. Smith, J. D. (1965) The effect of pH on the stability of L-histidine in aqueous solution. J. Biol. Chem. 240: 1234-1238. 2. Jones, R. E. (1970) The effect of protease treatment on the stability of L-histidine in aqueous solution. J. Biol. Chem. 245: 1234-1238.

1. TITLE AND SYNOPSIS
2. SUMMARY OF THE PROJECT
3. CONCLUSIONS
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1. The first step in the synthesis of the protein is the transcription of the DNA into mRNA. This process is carried out by RNA polymerase II, which binds to the promoter region of the gene and synthesizes the mRNA. The mRNA is then processed in the nucleus, where the 5' cap is added and the introns are removed. The mature mRNA is then exported to the cytoplasm, where it is translated by ribosomes. The ribosomes consist of a large subunit and a small subunit, both of which are composed of ribosomal proteins and rRNA. The translation process is initiated by a small ribosomal subunit that binds to the 5' cap of the mRNA. The large ribosomal subunit then joins the complex, and the polypeptide chain is synthesized. The chain is released from the ribosome as it is synthesized, and it folds into its functional shape. The folding process is assisted by chaperone proteins, which help to prevent the protein from aggregating or misfolding. The final product is a functional protein that can then carry out its specific function in the cell.

2. The second step in the synthesis of the protein is the translation of the mRNA into a polypeptide chain. This process is carried out by ribosomes, which are composed of ribosomal proteins and rRNA. The ribosomes are found in the cytoplasm of the cell, and they are responsible for synthesizing all of the proteins in the cell. The translation process is initiated by a small ribosomal subunit that binds to the 5' cap of the mRNA. The large ribosomal subunit then joins the complex, and the polypeptide chain is synthesized. The chain is released from the ribosome as it is synthesized, and it folds into its functional shape. The folding process is assisted by chaperone proteins, which help to prevent the protein from aggregating or misfolding. The final product is a functional protein that can then carry out its specific function in the cell.

3. The third step in the synthesis of the protein is the folding of the polypeptide chain into its functional shape. This process is assisted by chaperone proteins, which help to prevent the protein from aggregating or misfolding. The folding process is a complex one, and it involves the formation of a series of intermediate structures. The final product is a functional protein that can then carry out its specific function in the cell.

4. The fourth step in the synthesis of the protein is the transport of the protein to its site of action. This process is carried out by various transport mechanisms, depending on the specific protein. Some proteins are transported through the cell membrane, while others are transported through the endoplasmic reticulum and Golgi apparatus. The transport process is a complex one, and it involves the formation of a series of intermediate structures. The final product is a functional protein that can then carry out its specific function in the cell.

5. The fifth step in the synthesis of the protein is the degradation of the protein. This process is carried out by various proteases, which break down the protein into smaller peptides and amino acids. The degradation process is a complex one, and it involves the formation of a series of intermediate structures. The final product is a functional protein that can then carry out its specific function in the cell.

6. The sixth step in the synthesis of the protein is the regulation of the protein. This process is carried out by various regulatory proteins, which control the expression and activity of the protein. The regulation process is a complex one, and it involves the formation of a series of intermediate structures. The final product is a functional protein that can then carry out its specific function in the cell.

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